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The Chicago Sky

in the

Atwood Celestial Sphere

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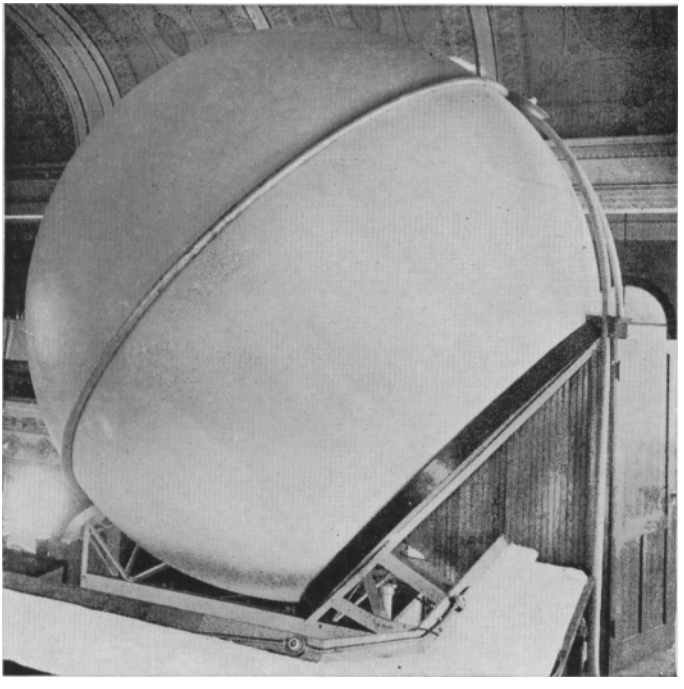

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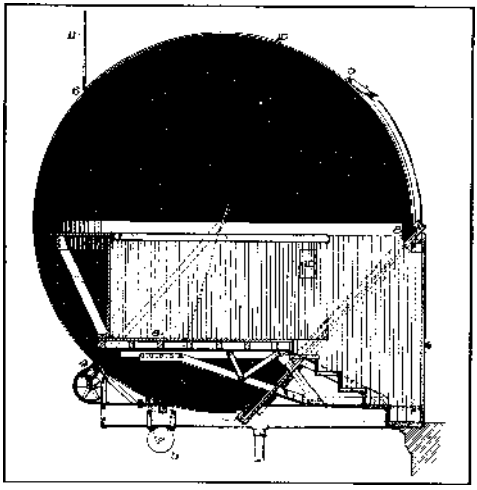
With the installation of the Atwood Celestial Sphere in one of its Museum halls in June, 1913, the Chicago Academy of Sciences presented to the public an unusual opportunity to study the constellations of stars seen from the latitude of Chicago, 40° 50' N. The only one of its kind in the world, the Sphere is a miniature reproduction of the sky over Chicago: a rotating, hollow shell of very thin sheet metal on which the stars are represented by perforations of different sizes. In the Sphere, unhampered by the light of the moon, the sun, the glow from street illuminations, or by capricious weather, one may in a very short time study the constellations for any season of the year, or any hour of the day. One sees the stars rise and set precisely as they appear to do in the real sky. In constructing the Sphere great care was used in the placement and relative sizes of the star openings, the result being an accurate and realistic sky-map of the stars which can be seen with the unaided eye, those of the first to the fifth magnitude inclusive.

Looking into the sky on a clear night, we receive the impression of a vast, dark dome decorated with a multitude of illuminations of various patterns and sizes. After an interval of an hour or more we notice that the locations of the constellations on this great background of space have changed. Watching this changing panorama over a period of several more hours, we see new figures being etched in the eastern sky, and the ones which we viewed earlier fade from sight in the west; while in the north the familiar figures are still to be seen above the horizon, but they have changed their locations and also their positions from the perpendicular to the horizontal, or vice versa, depending upon their locations in regard to the North Star.

If we trace the paths these stars have taken, we will perceive that the ones in the north have proscribed half or complete circles around the North Star; those which were in the east have moved overhead in a long line to the west; those in the far south rose in the southwest and traced long or short curves above the south horizon as they moved in their respective courses to set in the southwest. However, the apparent movement of these particular stars can be observed only in this latitude. Traveling farther south we will see that some of the north circumpolar constellations have set below the horizon; that those in the south are higher above the horizon; and upon reaching the equator we will see part of the north as well as part of the south circumpolar constellations above the horizon.

This apparent rising and setting of the stars is the result of the turning of the earth on its axis toward the east, completing one full rotation in twenty-four hours, while the apparent movement of the new stars rising in the south is the result of new horizons beyond

coming into view as we travel farther south along the great curve of the surface of the earth. Because of this great curve, wherever we live on the earth except at the equator, there will be some part of the heavens which will not be visible. At the equator in the course of a year we will have seen the entire expanse of the sky from the south pole to the north pole stars. Though we have no actual sense of motion, nevertheless, it is we who travel with the earth under the stars, not the stars marching in their orderly paths above us.



This endless parade of stars over-head is going on every moment of the day and night, but the overwhelming light from our brightest star, the sun, outshines the light from the other stars part of the twenty-four hours so that we are unaware of the stars shining in our daytime sky. We must therefore confine our star-gazing to the hours of darkness when our particular locality on the earth has turned away from the sun. We will need 365 cloudless nights of this gazing before we have seen a complete moving picture of the stars, planets and other celestial bodies unreeled upon this great dark screen in the theater of space. All of these phenomena are easily understood by demonstrations in the Sphere.

The Sphere is mounted with its axis inclined from the vertical so that its North Star is marked exactly the same number of degrees above its north horizon as is the terrestial north star, Polaris, above the Chicago horizon. That portion of the south polar heavens which is never visible to us in the Chicago latitude has been omitted from the sphere and this space is utilized as an entrance into the hemispherical room for the observers. Here, seated on a platform in a small

room, ceiled and walled by the hemisphere of the imaginary sky around us, we may well imagine ourselves to be in the moving picture theater of the ancient shepherds who, centuries before the Christian era, watched this nightly panorama moving above them and wove myths around the star pictures. The Latin and Greek names which they gave to these pictures are still used by our modern astronomers. The legends are still read today.

This effect, the re-creating of the Chicago sky, is produced by the light in the Museum hall coming through the perforations in the dome to the observers within the darkened interior of the Sphere. Here one has an opportunity for discussion rather than lecturing. The use of the Sphere has been found invaluable in the demonstration of certain facts of astronomy; for instance, the system of celestial coordinates, altitude and asimuth; right ascension and north and south declination. The hour lines are well defined along the celestial equator as is the ecliptic, the apparent path of the sun, moon and planets through the stars. The locations of the vernal and autumnal equinoxes may be seen and understood.

Its use by leaders of Boy Scouts and Girl Scouts, Campfire Girls and other organized groups is suggested, though it is of interest to every one. Classes of all ages, from kindergarten to college, will find it an aid to their individual interest or study of the sky. Officers of the Navy found it useful: an excellent opportunity to teach the men who were going to sea to recognize the constellations used for locating latitude and longitude on various parts of the high seas.

With a point of light directed from an electric pointer, one may at close range indicate the positions where variable stars are to be found as well as the locations of the doubles and trebles in the Chicago sky. This knowledge is of great aid to the student who may, at a later date, wish to study these localities in the real sky with his binoculars or small telescope. Here he may also locate the positions of the nebulae. A knowledge of the star groups, where these hazy patches of light are to be found, is necessary before one may locate with binocular or telescope these great masses of gaseous material and island universes made up of thousands of stars and cosmic dust.

The Sphere will be demonstrated upon request with the following reservations: make appointments several days in advance to avoid conflicting with previous schedules; babies in arms and children and adults afraid of the dark should not consider admittance; groups must confine their numbers to not less than ten nor more than twenty for each demonstration desired; they must allow at least forty-five minutes for each demonstration. The hours are as follows:

Mondays - - - - - - - - - - - - - - -	2:00 to 4:30 P. M.
Other days except Sundays and holidays - - - - - - - - - - - - -	9:30 to 11:30 A. M. 2:00 to 4:30 P. M.

This service is free at all times. A technical descriptive booklet of thirty-six pages may be purchased for 10 cents, postpaid.